

hydroxide (page 4, lines 11 to 26), and a substrate, more specifically a laminate and metal-foil clad laminate as claimed (page 3, lines 4 to 9) at page 2 of the Official Action.

As described in the paragraph [0011] of the present specification, the present invention is completed on the basis of the following finding by the present inventors.

In this regard, the present inventors have found that a printed wiring board which is obtained from a thermosetting resin composition obtained by incorporating as a filler an aluminum hydroxide-boehmite composite, obtained by hydrothermal treatment of aluminum hydroxide, into a thermosetting resin, is free from irregularities of a molded appearance, excellent in heat resistance and good in solder heat resistance and electrical characteristics.

The aluminum hydroxide-boehmite composite of the present invention has the following feature. The aluminum hydroxide-boehmite composite (A) of the present invention is a composite in which boehmite crystallized in a boehmite-conversion step of aluminum hydroxide as a raw material by hydrothermal treatment is combined with aluminum hydroxide. It is unobviously different from a conventionally-known partial dehydrated product of aluminum hydroxide which is obtained by simply heating and calcining aluminum hydroxide in air.

Although it is not clear what system causes the above difference, the following is believed to be the case as disclosed in paragraph [0019] of the present specification, although Applicants do not wish to be bound by any particular theory in this regard.

In the partial dehydrated product of aluminum hydroxide, a partially-dehydrated aluminum hydroxide is generated only by dehydration of crystallization water from the surfaces of aluminum hydroxide particles. In contrast, in the case of the aluminum hydroxide -boehmite composite (A) of the present invention, a crystal of boehmite, which is generated by a precipitation reaction of boehmite taking place after the dissolution of a raw material aluminum hydroxide, known as a generation system of boehmite, grows in contact with a crystal of aluminum hydroxide and restrains the crystal of aluminum hydroxide so that the dehydration of water bonding to the crystal of aluminum hydroxide is suppressed, which causes an increase in the dehydration temperature.

The rejection indicates that Brown et al. discloses an aluminum hydroxide-boehmite composite obtained by hydrothermal treatment of aluminum hydroxide on page 4, lines 11 to 26 and that the present invention is therefore anticipated by Brown et al.

In reply, Brown et al. describes in page 4, lines 11 to 12, essentially, the novel feature of the thermally stable aluminum hydroxide of the present invention is the surprisingly low boehmite content relative to the average particle size.

However, the ratio of boehmite in the aluminum hydroxide-boehmite composite obtained by hydrothermal treatment, used in the present invention, is higher than that of a conventional heat-treated product of aluminum hydroxide, as shown in the attached Experimental Report in Rule 132 Declaration form by H. Mishima, the first named inventor herein. Therefore, the aluminum hydroxide-boehmite composite of the present invention is unobviously different from the thermally stable aluminum hydroxide of Brown et al.

Moreover, Brown et al. describes the following in page 4, lines 20 to 26. A suitable mechanical treatment would be provided for example by the application of compressive forces to aluminum hydroxide to increase polycrystallinity. Without being bound to any particular theory, it appears that structural degradation by such means creates the conditions for a more easy diffusion of water to the exterior of the crystals, thereby minimizing the tendency to build-up of hydrothermal pressure within the crystals and hence the reduced tendency towards boehmite formation.

Thus, Brown et al. merely discloses that hydrothermal pressure within the crystals is minimized by increasing polycrystallinity by means of the application of compressive forces and thus making diffusion of water, when heated, to the exterior of the crystals more easy. The theory of the rejection that Brown et al. discloses aluminum hydroxide obtained by hydrothermal treatment is thus untenable.

Brown et al. merely disclose in the experiment described on page 7 "Size reduction of the aluminum hydroxide particles was effected by means of a vibration mill" (lines 11 to 12) and the step of heating in an electric oven operating at a temperature of 220°C (lines 17 to 19). It is

apparent that aluminum hydroxide of Brown et al. is completely and unobviously different from the aluminum hydroxide of the present invention obtained by hydrothermal treatment.

As shown in the attached Declaration, in comparison with a conventionally-known partial dehydrated product of aluminum hydroxide which is obtained by heat-treating aluminum hydroxide in air, the aluminum hydroxide boehmite composite, obtained by the hydrothermal treatment of the present invention, has a higher dehydration starting temperature of water bonded to aluminum hydroxide and almost no pores are generated by the dehydration so that it is excellent in affinity to a resin and a molded appearance does not easily become irregular.

The aluminum hydroxide-boehmite composite of the present invention is novel and unobvious over the prior art, especially in view of the attached declaration which shows that the laminates of the present invention were free from irregularities of a molded appearance.

The secondary references clearly do not overcome the above-discussed deficiencies of Brown.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975

Hiroyuki MISHIMA et al.

By:

Matthew M. Jacob

Matthew M. Jacob

Registration No. 25,154

Attorney for Applicants

MJ/kes
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
August 15, 2005